



US008709494B2

(12) **United States Patent**
Daniel(10) **Patent No.:** **US 8,709,494 B2**
(45) **Date of Patent:** ***Apr. 29, 2014**

(54) **PLACENTAL TISSUE GRAFTS**

(71) Applicant: **MiMedx Group, Inc.**, Marietta, GA (US)

(72) Inventor: **John Daniel**, Woodstock, GA (US)

(73) Assignee: **MiMedx Group, Inc.**, Marietta, GA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/954,974**(22) Filed: **Jul. 30, 2013**(65) **Prior Publication Data**

US 2013/0337035 A1 Dec. 19, 2013

Related U.S. Application Data

(63) Continuation of application No. 13/569,095, filed on Aug. 7, 2012, now Pat. No. 8,597,687, which is a continuation of application No. 11/840,728, filed on Aug. 17, 2007, now Pat. No. 8,372,437.

(60) Provisional application No. 60/838,467, filed on Aug. 17, 2006.

(51) **Int. Cl.**
A61K 35/50 (2006.01)(52) **U.S. Cl.**
USPC **424/583**(58) **Field of Classification Search**
None
See application file for complete search history.(56) **References Cited****U.S. PATENT DOCUMENTS**

4,361,552 A 11/1982 Baur, Jr.
4,846,165 A 7/1989 Hare et al.
5,197,976 A 3/1993 Herweck et al.
5,336,616 A 8/1994 Livesey et al.
5,350,583 A 9/1994 Yoshizato et al.
5,580,923 A 12/1996 Yeung et al.
5,607,590 A 3/1997 Shimizu
5,612,028 A 3/1997 Sackier et al.
5,618,312 A 4/1997 Yui et al.
5,711,969 A 1/1998 Patel et al.
5,882,929 A 3/1999 Fofonoff et al.
5,885,619 A 3/1999 Patel et al.
5,916,266 A 6/1999 Yui et al.
5,955,110 A 9/1999 Patel et al.
5,968,096 A 10/1999 Whitson et al.
5,997,575 A 12/1999 Whitson et al.
6,143,315 A 11/2000 Wang et al.
6,146,414 A 11/2000 Gelman
6,152,142 A 11/2000 Tseng
6,326,019 B1 12/2001 Tseng
6,379,710 B1 4/2002 Badylak
6,398,797 B2 6/2002 Bombard et al.
6,544,289 B2 4/2003 Wolfinbarger et al.

6,573,249 B2 6/2003 Lezdey et al.
6,576,618 B1 6/2003 Herndon et al.
7,045,148 B2 5/2006 Hariri
7,049,139 B2 5/2006 Tan et al.
7,101,710 B2 9/2006 Tsai et al.
7,244,444 B2 7/2007 Bates
7,311,904 B2 12/2007 Hariri
7,311,905 B2 12/2007 Hariri
7,347,876 B2 3/2008 Tsai
7,413,734 B2 8/2008 Mistry et al.
7,494,802 B2 2/2009 Tseng et al.
7,569,385 B2 8/2009 Haas
7,611,895 B2 11/2009 Tan et al.
7,727,550 B2 6/2010 Siegal et al.
7,824,671 B2 11/2010 Binder et al.
7,871,646 B2 1/2011 Ghinelli
7,905,826 B2 3/2011 Case et al.
7,928,280 B2 4/2011 Hariri et al.
7,968,336 B2 6/2011 Atala et al.
7,976,836 B2 7/2011 Hariri
7,993,918 B2 8/2011 Paludan et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CN 200610156533 12/2007
FR 2892311 4/2007
JP 08-266613 10/1996

OTHER PUBLICATIONSBhatia, et al., "The Mechanism of Cell Interaction and Response on Decellularized Human Amniotic Membrane: Implications in Wound Healing," <http://www.woundsresearch.com/article/7614>, pp. 1-24, May 7, 2008.Ebihara, et al., "The Functions of Exogenous and Endogenous Laminin-5 on Corneal Epithelial Cells," *Exp. Eye Res.*, (2000), 71:69-79.Fukuda, et al., "Differential Distribution of Subchains of the Basement Membrane Components Type IV Collagen and Laminin Among the Amniotic Membrane, Cornea, and Conjunctiva," *Cornea*, (1999), 18(1):73-79.

(Continued)

Primary Examiner — Allison Ford(74) *Attorney, Agent, or Firm* — Foley & Lardner LLP(57) **ABSTRACT**

A method for preparing placenta membrane tissue grafts for medical use, includes obtaining a placenta from a subject, cleaning the placenta, separating the chorion tissue from the amniotic membrane, mounting a selected layer of either the chorion tissue or the amniotic membrane onto a drying fixture, dehydrating the selected layer on the drying fixture, and cutting the selected layer into a plurality of tissue grafts. Preferably, the drying fixture includes grooves or raised edges that define the outer contours of each desired tissue graft, after they are cut, and further includes raised or indented logos that emboss the middle area of the tissue grafts during dehydration and that enables an end user to distinguish the top from the bottom side of the graft. The grafts are comprised of single layers of amnion or chorion, multiple layers of amnion or chorion, or multiple layers of a combination of amnion and chorion.

10 Claims, 5 Drawing Sheets